

Atty Docket No.: CPH35726-D1

Serial No.: 10/072,362

REMARKS**Present Status of Patent Application**

Claims 10-18 remain pending of which claim 10 has been amended and claims 13-18 has been newly added, to more clearly describe the claimed invention. Further, the Drawings (FIG. 2C) has been amended to remove the informal hand writing. It is believed that no new matter adds by way of these amendments made to the claims or specification, or otherwise to the application. For at least for the following reasons, Applicant respectfully submits that claims 10-18 patently define over the prior art of record. Reconsideration is respectfully requested.

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Objection to Drawing

The Office Action objected to the drawings because FIG. 2C contains informal handwritings.

In response thereto, Applicants would like to thank the Examiner for pointing out the informalities, and accordingly, Applicants have corrected the drawings as shown in separate accompanying sheets. After entry of the foregoing amendments to FIG. 2C, it is believed that the above objections can be overcome. Reconsideration is respectfully requested.

Objection to Claims

The Office Action objected to claims 10-12 because of some informalities and or defects.

In response thereto, Applicants would like to thank the Examiner for pointing out the informalities, and accordingly, Applicants have amended claim 10. After entry of the foregoing amendments to claim 10, it is believed that the above objections can be overcome. Reconsideration is respectfully requested.

Response to Claims Rejections under 35 USC §102

The Office Action rejected claims 10 and 12 under 35 U.S.C. 102(b), as being anticipated by Lancaster et al. (US-4,835,584, hereinafter Lancaster).

Applicants respectfully disagree and traverse the above rejections as follows. Independent claim 10, as amended, is allowable for at least the reason that Lancaster substantially fails to teach, suggest or disclose every features of the claimed invention. More specifically, Lancaster fails to teach, suggest or disclose a MOSFET device comprising at least "a gate electrode disposed over said first and second trenches, the gate electrode comprising a first vertical portion, a second vertical portion and a horizontal portion, wherein the first vertical portion being embedded inside the first trench completely filling the first trench, the second vertical portion being embedded inside the second trench completely filling the second trench, and the horizontal portion being disposed over the substrate and connecting said first

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and second portions together, as required by the amended claim 10". The advantage of the above structure is that at least the above gate structure can be fabricated from a more simplified method. Further, the effective width of the gate can be effectively increased by 2nt while at the same time the lateral surface occupation of the gate can also be effectively reduced and thereby allowing increase in the integration of the semiconductor device.

To the contrary, Lancaster substantially discloses (please see FIG. 5H-5J and related disclosure) a semiconductor structure comprising a plurality of trenches formed side by side into the substrate, a gate electrode (58) formed continuously over the trenches (56) bisecting a pair of trenches. The trenches are filled with a dielectric material (70) by forming the gate electrode (58). In other words, the vertical portions of the gate electrode (58) in Lancaster Patent do not completely fill the trenches as required by claim 10 of the claimed invention. Accordingly, Applicant respectfully submits that Lancaster cannot anticipate Claim 10 in this regard.

For at least the foregoing reasons, Applicants respectfully submit Claim 10 and 12 patently define over Lancaster. Reconsideration and withdrawal of these rejections is respectfully requested.

Further, Applicants have added new claims 13-18. Applicants further submit that independent claim 13 is allowable over Lancaster for at least the reason that Lancaster fails to teach, suggest or disclose a MOSFET device comprising at least "a first shallow doped region having dopants of first type within the substrate disposed at an upper corner adjacent to the first vertical portion and a second shallow doped region having dopants of first type disposed at an upper corner adjacent to the second portion of the electrode; and a first deep source region having dopants of second type extending from the first shallow doped region and a

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second deep drain region having dopants of second type are disposed in a region within the substrate deeper than the first and second trench as required by Claim 13. Instead, Lancaster substantially teaches (please see FIG. 5K and col. 4, lines 46-48) a source/drain region (73, 74). In other words, Lancaster substantially fails to teach, suggest or disclose at least a first shallow doped region and a second shallow doped region having dopants type different from that of the source/drain region. Accordingly, Applicant respectfully submits that Lancaster cannot anticipate Claim 13 of the claimed invention in this regard.

Further, Applicants respectfully submit that the newly added independent Claim 16 is allowable over Lancaster for at least the reason that Lancaster failed to teach, suggest or disclose a MOSFET device comprising at least "a gate electrode disposed over said first and second trenches, the gate electrode comprising a first vertical portion, a second vertical portion and a horizontal portion, wherein the first vertical portion being embedded inside the first trench, the second vertical portion being embedded inside the second trench, and the horizontal portion being disposed over the substrate and bisecting said first and second vertical portions together, as required by Claim 16. Instead, Lancaster substantially teaches filling the trenches with a dielectric material (70) after forming the gate electrode (58), clearly indicating that the horizontal portion do not bisect the vertical portions of the gate electrode (58). Accordingly, Applicant respectfully submits that Lancaster cannot anticipate Claim 16 of the claimed invention in this regard.

For at least the foregoing reasons, Applicants respectfully submits that newly added Claims 13-18 also patently define over Lancaster as well. Reconsideration is respectfully

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requested.

Response to Claims Rejections under 35 USC§103

The Office Action rejected claims 11 under 35 U.S.C. 103(a) as being unpatentable over Lancaster in view of Kimura et al. (US-5,029,321, hereinafter Kimura).

Applicants respectfully disagree and would like to point out that even though the Office Action relied upon Kimura to disclose the thermal oxidation process for forming the gate oxide layer, still Kimura cannot cure the specific deficiencies of the claimed invention for at least the reasons as substantially discussed above. Accordingly, Applicants respectfully submit that Claim 11 also patentably define over Lancaster and Kimura for at least the reasons set forth above. Reconsideration is respectfully requested.

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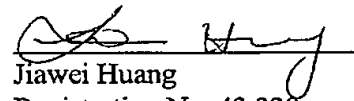
CONCLUSION

For at least the foregoing reasons, it is believed that all pending claims 10-18 are in proper condition for allowance. If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel to arrange for such a conference.

Date: 9/9/2003

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